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Nursing empowerment by simulation in percutaneous endoscopic gastrostomy short-time complication control: Protocol study

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Abstract:

BACKGROUND: Percutaneous endoscopic gastrostomy (PEG) is one of the most suitable methods for long-term nutritional support. In this study, the empowerment of intensive care nurses is examined by a simulation technique to control the short-term complications of PEG.

METHODS: A two-group clinical trial study will be conducted on eighty intensive care nurses in a teaching hospital in Tehran. The study participants will be randomly assigned to one of the two control and intervention groups based on the inclusion criteria. A pretest will be given to both groups using a researcher-made tool. Then, the empowerment package developed by the researcher will be provided to the intervention group in two stages. Next, a posttest will be administered. After this stage, patients' complications with PEG will be observed using a researcher-made checklist. Nurses' performances in both control and intervention groups will be evaluated in terms of preventing and controlling short-term complications up to 1 week after PEG insertion. All of the data collected in this research will be analyzed with statistic tests such as independent *t*-test, standard deviation, T pair, ANOVA, and mean based on the SPSS 16 software.

RESULTS: At present, the research team is designing an empowerment package for nurses and tools needed to evaluate the nurses' empowerment.

CONCLUSION: This study will attempt to design and evaluate the empowerment package of graduate nurses with a cognitive empowerment approach and using a simulation technique to care for patients with PEG and to control their short-term complications.

Keywords:

Complications, critical care nurses, empowerment, percutaneous endoscopic gastrostomy, short term, simulation training

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Introduction

Patients admitted to intensive care units due to life-threatening conditions and different diagnoses need to have comprehensive support to meet their basic and essential needs, such as nutritional support.[1,2] In the absence of the necessary nutrients, patients admitted to the intensive care unit with severe organ failure and worsening health conditions experience several side effects including weakness, severe skeletal muscle wasting, energy deficit, protein–energy malnutrition, immune deficiency, increased risk of infection, prolonged hospitalization, re-admission, and increased mortality rates.[3-6]

Percutaneous endoscopic gastrostomy (PEG) is one of the methods used for nutritional support. This method is used in some cases

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such as neurological disorders such as myasthenia gravis, cerebrovascular accident, cerebral trauma, trauma to the upper gastrointestinal tract, and in patients with swallowing problems.[7,8] Nutritional support through PEG compared to other nutritional support methods is less dangerous, is less costly, is less complicated, and is also well tolerated by the patient. The length of stay of these patients is lower compared to hospitalization under other nutritional support methods, and as a result, patients are less likely to suffer from complications of prolonged hospitalization. Another advantage of this method is that the need for anesthesia during the insertion of the PEG catheter is eliminated.[9] This nutritional method also improves the quality of patients' lives.[10]

This method, like other invasive methods, has common complications such as pain, infection, catheter displacement, catheter obstruction, flatulence, nausea, diarrhea, constipation, leakage around the catheter, and irritation of the skin around it.[11,12] For example, its risk of aspiration, mortality rate, and hemorrhage at the site of the catheter insertion are about 0.3%–1%, 0.003%–0.01%, and 0.02%–0.06%, respectively.[13,14] One of the common complications in this method is perforation with an incidence of 0.008%–0.04%. However, studies have shown that the incidence of these complications is affected by inadequate nursing skills in the care of patients with PEG.[15,16] Nurses, as the main members of the medical team, play an important role in reducing the complications caused by various caring, supportive, and therapeutic approaches, including the care of patients with PEG. In this regard, nurses must be empowered to provide care for such patients.[17-20] Empowerment is a motivational process with the aim of psychology and human resource skills development for their efficient and effective use in the organization.[21,22] Empowerment is affected by various factors including staff education, knowledge, intelligence, and skills. One of the effective approaches to empowerment is the cognitive approach, in which following the education and integration of new knowledge with previous learning, it attempts to impart new knowledge to each individual and causes a change in his/her behavior and empowerment.[23,24] In order to create a suitable context with the aim of transferring new knowledge and integrating it with previous knowledge of individuals, it is necessary to use an appropriate approach. One of the approaches that can be used in adult education is the simulation method which has been used in medical sciences since ancient ages.[25,26] In a simulation method, through a designed learning environment, attempt is made to cause learning by using a device, simulator, and a simulated patient based on a predesigned scenario.[19] Using the simulation method can enhance the empowerment of the medical team members, including trained nurses, and enable the education to be established in a safe and controlled environment. The use of simulation in teaching clinical skills has a significant effect.[27] In a study by Ahmad and Agel, the effect of traditional and simulation education on CPR learning skills in nursing students was compared, and the results showed that students were more successful through simulation than traditional methods.[28] The results of a study in Saudi Arabia about the impact of the simulation method on the nursing students' empowerment regarding PEG showed that simulation by using educational films and practice in the skills laboratory has an important role in learning and improving the participants' academic competence.[29] The findings of the study of Nikravan Mofrad and Zahri Anbohi about the effect of using the simulation method on the empowerment of nursing students in the field of prehospital (emergency medical services) operations showed that this educational method is essential for promoting nurses' skills.[19] The results of another study by Rahmani Beilondi and Rahmani comparing the effect of maternity education with traditional and simulation method to the midwifery students showed that students who had been trained in simulation method were more skilled in the neonatal breech delivery.[27]

In a few studies, the empowerment of nurses in the care of patients with PEG and a strategy to prevent its short-term complications has been addressed. In most studies on simulation, students have been the target group, and about this educational method and its impact on the empowerment of working nurses' skills have not been studied. Furthermore, standard tools for assessing the ability and competence of nurses in the care of patients with PEG have been less applied. Therefore, in this study, we attempt to design an empowerment package for intensive care nurses in the caring for and prevention of complications caused by short-term nutritional support in patients with PEG. Finally, an attempt will be made to provide an appropriate tool for assessing the nurses' empowerment in this field.

Methods

The present study is a protocol study that has been registered with ethics code IR.TUMS.FNM.REC.1397.215 in Tehran University. This research is in progress. This two-group clinical trial study will be conducted on nurses in the intensive care units of three teaching hospitals located in a hospital complex affiliated to Tehran University of Medical Sciences. The participants are comprised of intensive care nurses and patients with PEG. The first group includes nurses working in two different ICU wards in this hospital. All the nurses participating in this research have been employed in the ICU for more than 6 months, all of them are graduates of nursing medical science and are not attending any other educational courses simultaneously. There are

three exclusion criteria for nurses in this research including turning over from the intensive care unit to the internal-surgical wards, turning over to other hospitals, and unwillingness to participate in research. Nurses will be selected through purposive sampling, and then, these two wards will be randomly allocated to two groups of control and intervention groups. The number of nurses working in each of these wards is at least 40, so in this study, the sample size is equal to the research population.

The inclusion criteria for patients participating in this research consist of being admitted in the emergency and neurosurgery intensive care units, candidate for this device for the first time, and patient admission in these two wards, from the PEG insertion time up to a week later. They will be omitted from this research if they turn over to another part of hospital or to another ICU also to another hospital, are transferred to other wards within 1 week after insertion of the PEG, or patients' death.

Random sampling will be employed. The control group consists of patients admitted to both emergency and neurosurgery intensive care units, by convenience sampling method and taking into account 20% probability of attrition, 30 samples will be assigned to each group. The research tools consist of three tools: a demographic data questionnaire, a researcher-made checklist for assessing the empowerment of nurses, and short-term complications of PEG. Furthermore, in designing tools, the classification of nursing interventions (nursing intervention classification) and outcomes (nursing outcome classification), available guidelines, books, and articles will be used.[17,30] Then, the validity and reliability of these tools will be evaluated using content validity and Kuder–Richardson method. To determine the content validity of the research tools, the viewpoints of ten experts in the field of research will be taken. To determine reliability, the research tools are completed by thirty intensive care nurses (except for the two wards assigned to the research process), then Kuder–Richardson method is calculated. Alpha over 70% is acceptable in this research.

After obtaining the necessary permissions, the researcher will introduce him/her to the hospital authorities and will provide the necessary explanations regarding the research objectives and method. Then, the researcher will introduce him/herself to the participants and after explaining the research objectives will acquire informed consent for participation in the research, and a pretest will be taken from both intervention and control groups. A group will be formed in one of the social messengers for nurses in the intervention group and material in the form of text or slides will be shared into the group weekly. The educational content is planned in a way that can be reviewed in 30 min. For 4 weeks, ambiguities and questions in relation to the educational content will be shared and the experiences of the participants will be discussed and interacted with the group and will be managed by the researcher.

Immediately after this phase, a 1-day workshop will be held to enhance nurses' empowerment to take care of patients with PEG and prevent its complications. The quality of educational videos and a scenario designed to practice on the medical moulage will be designed based on a review of the related books, articles, and guidelines. To determine the content validity of the educational content, the viewpoints of ten experts in the field of research will be taken. We manage a virtual network group that have shared parts of the educational content with the aim of motivating the members of the intervention population, which is available at the 1-day workshop. The workshop will be designed and held for 1 day and 6 h (providing educational materials for 2 h, simulation process using a 30-min video tutorial, and an exercise on the medical moulage based on a design scenario for 3½ h). Two weeks after the workshop, posttest will be taken from both groups of intervention and control. After this phase, using a researcher-made checklist, the incidence of short-term complications up to 1 week after PEG insertion in patients hospitalized in both wards will be examined until the specified number of samples is achieved. After completing the sampling process, in order to observe ethical considerations, all educational content provided to the intervention group will be provided to the control group. The data will be analyzed by the Statistics Package for Social Science (SPSS) v.16 for windows. software using descriptive and inferential tests such as Chi-square and paired *t*-test, ANOVA.

Results

This intervention can lead to empowerment in critical care nurses who take care of patients with PEG catheter.

Discussion

This study has several strengths. It is attempting to design an empowerment package with a special simulation approach for critical nurses. This package is usable in Iran and in other countries in the WHO Regional Office for the Eastern Mediterranean (EMRO) region. In addition, a tool for evaluating the ability of nurses to prevent and control the short-term complications in patients with PEG will be designed. The simulation has a great impact on the training of clinical skills. A study by Nikravan Mofrad and Zahri Anbohi (2012) shows the effect of simulation techniques on nursing student's empowerment in prehospital medical processes. The results of the mentioned study indicate that this

technique is necessary to promote the clinical skills of nursing.[19] In another research by Rahmani Beilondi and Rahmani, the effect of training the students concerning two methods of traditional and simulation delivery in midwifery has been compared. The results show that the students learning through the simulation method with newborn breech in midwifery are more skillful compared with other students.[27]

In another research conducted by Ahmad and Agel, the research group was studied to investigate the effect of the simulation method on the level of cardiopulmonary resuscitation knowledge and skills acquisition and retention compared with traditional training for nursing students. The results showed differences between the simulation training group and the traditional manikin training group on the acquisition of cardiopulmonary resuscitation knowledge and skills.[28] In another research done in Saudi Arabia on nursing students in supportive nutrition through PEG in ICU patients, the results showed that the quality of education in the group working in a skill laboratory with simulation method and film was more effective in the nursing care of PEG.[29]

Conclusion

Regarding the burden of noncommunicable and traumas on the health system of countries, an effective technique should be developed to prevent the complications of care and treatment of such diseases. Regarding the position of nurses as a member of the medical team that have the most interaction with patients and their families, they can play a significant role in reducing the burden of diseases and their complications and improve the quality of patients' lives if they have the appropriate empowerment. If the results of this study indicate that the use of simulation is an appropriate and effective method to empower and enhance the nurses' skills in nursing care for patients with nutritional support through PEG, it can be used as an appropriate approach to empower professional skills needed by nurses. We will attempt to design and evaluate the empowerment package of graduate nurses based on a cognitive approach and using a simulation method to care for patients with PEG and control its short-term complications.

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Conflicts of interest

There are no conflicts of interest.

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